



#7/Response (NE)  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Alvin P. Short

Examiner: Mai, Anh D.

Serial No: 09/852,899

Group Art Unit: 2814

Filed: May 10, 2001

Docket: 8055-25 (01 P 08366 US)

For: **INCREASE IN DEEP TRENCH CAPACITANCE BY A CENTRAL GROUND ELECTRODE**

Commissioner of Patents  
Washington, D.C. 20231

**RESPONSE**

*Please Enter  
A.M. 1/23/03*

This is a response to the Final Office Action mailed on November 08, 2002. Claims 1-6 are pending in the application and stand rejected. The Examiner's reconsideration of the claim rejections is respectfully requested.

Claims 1-4 and 6 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Park (U.S. Patent No. 5,677,225) in view of Wu (U.S. Patent No. 5,985,729). Claim 5 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Park and Wu as applied to claim 1 above, and further in view of Chang (US 6,077,739). Applicant respectfully traverses the rejections.

**CERTIFICATE OF MAILING 37 C.F.R. § 1.8(a)**

I hereby certify that this correspondence (and any document referred to as being attached or enclosed) is being deposited with the United States Postal Service as first class mail, postage paid in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231 on January 08, 2003.

Dated: 1/8/02

Frank V. DeRosa  
Frank V. DeRosa

To establish a prima facie case of obviousness, at the very minimum, the prior art references must teach or suggest all the claim limitations. (see, e.g., MPEP 2141, 2143, 2143.03). Claim 1 of the present invention includes, *inter alia*, a first conductive material formed in the trench.

The Examiner acknowledges that Park does not teach the first conductive material (26') contacting the buried plate (23) on the lower portion of the side of the trench. Indeed, Park clearly discloses the first conductive layer (26') being in contact with the diffusion region only at a portion of the bottom portion of the trench, but not the sidewalls of the trench.

The Examiner contends that Wu teaches a semiconductor device including a first conductive material (14A) formed through the bottom of the trench (10A) connecting the buried plate (11) on a lower portion of the side walls of a trench (10A) (see Fig. 10). However, this does not cure the deficiencies of Park, in that Wu does not disclose the first conductive material (14A) being connected to a buried plate (11) at both a bottom portion of the trench and a lower portion of the sidewalls of the trench, as essentially claimed in claim 1.

More specifically, even assuming, *arguendo*, that element 10A is considered a “trench” as recited in claim 1, Figure 10 does not show the first conductive material (14a) contacting the buried plate (11) at the bottom portion of the trench (10A), as claimed in claim 1. In particular, Figure 10 only illustrates the first conductive material (14A) contacting the buried plate (11) at a sidewall of the trench (10A).

Furthermore, even assuming a “trench” as recited in claim 1 refers to element (10) in Figure 10 of Wu, Wu does not disclose that the first conductive material (14a) contacts the buried plate (11) at the sidewalls of the trench. In stark contrast, it is clearly shown that the

dielectric layer (16) separates the pillar (14a) from the sidewalls of the trench (10).

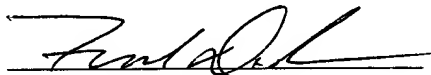
Therefore, claim 1 is believed to be patentable and non-obvious over the combination of Park and Wu because the combination does not teach or suggest a first conductive material that connects to the buried plate at a bottom portion of the trench and a lower portion of the sidewalls of the trench. Further, claims 2- 4 and 6, which depend from claim 1, are believed to be patentable and non-obvious over the combination of Park and Wu for at least the same reasons as claim 1.

Further, claim 5, which depends from claim 1, is believed to be patentable and non-obvious over the combination of Park, Wu, and Chang because Park and Wu, as applied to claim 1, is legally deficient as discussed above.

Accordingly, the withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

In view of the foregoing remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable action is respectfully requested.

Respectfully submitted,

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In re application of: Alvin P. Short

Serial No.: 09/852,899

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For: INCREASE IN DEEP TRENCH CAPACITANCE BY A CENTRAL GROUND ELECTRODE

Assistant Commissioner for Patents  
Washington, D.C. 20231AMENDMENT TRANSMITTAL FORM

Sir:

Transmitted herewith is an amendment in the above-identified application.

- ☐ Small entity status of this application under 37 C.F.R. § 1.9 and 1.27 has been established by a verified statement previously submitted.
- ☐ A verified statement to establish small entity under 37 C.F.R. § 1.9 and 1.27 is enclosed.
- ☒ No additional fee is required.

The fee has been calculated as shown below:

	(Col. 1)	(Col. 2)	(Col. 3)	SMALL ENTITY	OTHER THAN SMALL ENTITY
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDIT. FEE
TOTAL	17*	MINUS 20**	= 0 X	9	\$ 0
INDEP.	3*	MINUS 3***	= 0 X	42	\$ 0
[ ] FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				X 140	\$ 280
				TOTAL	OR TOTAL \$ 0
				ADDIT. FEE	\$ 0

\*If the entry in Co. 1 is less than entry in Col. 2, write "0" in Col. 3.

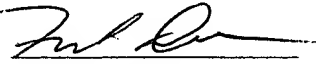
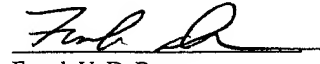
\*\*If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\*If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The Highest No. Previously Paid For" (Total or indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

- ☐ Please charge Deposit Account No. \_\_\_\_\_ in the amount of \$\_\_\_\_. Two (2) copies of this sheet are enclosed.
- ☐ Please charge fee of \$\_\_\_\_ for \_\_\_\_\_ by Credit Card Payment Form PTO-2038 enclosed herewith
- ☒ Please charge any deficiency as well as any other fee(s) which may become due under 37 C.F.R. § 1.16 and/or 1.17 at any time during the pendency of this application, or credit any overpayment of such fee(s) to Deposit Account No. 50-0679. Also, in the event any extensions of time for responding are required for the pending application(s), please treat this paper as a petition to extend the time as required and charge Deposit Account No. 50-0679 therefor. **TWO (2) COPIES OF THIS SHEET ARE ENCLOSED.**

Respectfully submitted,

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Attorney for ApplicantCERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8(a)I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postpaid in an envelope, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231 on January 8, 2003.Dated: 1/8/03  
Frank V. DeRosa